HNML-Laser Diode Module
OPERATING INSTRUCTIONS

FRANKFURT LASER COMPANY
An den 30 Morgen 13, 61381 Friedrichsdorf, Germany
Tel.: +49(0)6172.27978-0 Fax: +49(0)6172.27978-10
E-mail: sales@frlaserco.com; Internet: **WWW.FRLASERCO.COM**

Contents

1. FOREWORD 3

2. INSPECTION 3

3. INSTALLATION 3

4. WORKING INSTRUCTIONS 4

4.1 Safety precautions while operating the product 4

4.2 Installation 4

4.3 Heatsinking 4

4.3 Laser module operation requirements 4

5. ELECTRICAL CONNECTION 5

5.1 Module with wires 5

5.2 Module with connector 5

5.3 Module with PCS & BNC 5

5.3 Working with the module for module with TTL input (Module with connector) 6

5.4 Working with the module for module with analogue modulation (Module with connector) 7

5.5 Working with the module for module with TTL input (Module with PCS & BNC) 8

5.6 Working with the module for module with analogue modulation (Module with PCS & BNC) 9

6. ADJUSTING THE OPTICAL OUTPUT 10

7. MAINTENANCE AND REPAIR 11

8. GUARANTEE 11

9. MODULE DRAWINGS 12

9.1 HMML with connector 12

9.2 HMML with PCS and BNC 12

10. ACCESSORIES 13

10.1 Wall Plug Power Supply 13

10.2 Laser Diode Module Mount 13

FRANKFURT LASER COMPANY
An den 30 Morgen 13, 61381 Friedrichsdorf, Germany
Tel.: +49(0)6172.27978-0 Fax: +49(0)6172.27978-10
E-mail: sales@frlaserco.com; Internet: **WWW.FRLASERCO.COM**

1. FOREWORD

Dear Customer,

Thank you for buying a Frankfurt Laser Company laser diode module. It was developed on the basis of the latest achievements in science and technology and produced using state-of-the-art components.
Since laser modules are designed to be used as components for installation into an OEM product, no provisions were or could be made to provide the laser safety which would normally be required of your application and equipment into which they will be installed. By accepting delivery of this device, you accept responsibility to insure all necessary precautions will be taken with regards to laser safety in your application.
Please, use the laser diode module with the purpose it is designed for and in accordance with the instructions provided. Improper or unauthorized use of this device will void the guarantee.

The vendor will not be liable for the consequences of any incorrect or unsafe use of the laser diode module.

2. INSPECTION

Before using the laser diode module for the fist time, please:

- Make sure the packing is undamaged
- Make sure the laser diode module shows no visible signs of damage

In the event of any damage, please, notify the vendor immediately. Retain the original packing material to return damaged goods and use foam packaging for cushioning where appropriate.

3. INSTALLATION

Before installing the laser diode module into the set-up, make sure that:

- The serial number of the product corresponds to the number in the packing list
- The supply voltage and laser diode module control signals correspond to those set by yourself

ATTENTION!
Laser diode module housing has electrical potential

FRANKFURT LASER COMPANY
An den 30 Morgen 13, 61381 Friedrichsdorf, Germany
Tel.: +49(0)6172.27978-0 Fax: +49(0)6172.27978-10
E-mail: sales@frlaserco.com; Internet: **WWW.FRLASERCO.COM**

4. WORKING INSTRUCTIONS

4.1 Safety precautions while operating the product

The laser diode mounted in the module is able to create radiation, the appropriate safety precautions applicable in your country to this eye safety laser class must be observed.

4.2 Installation

It is strictly prohibited to apply mechanical force to the laser diode module housing while it is used or installed in the set-up. It can lead to instantaneous damage of laser diode and optical system.

4.3 Heatsinking

To ensure correct operation of the laser diode module it may be necessary to heat sink the module.
Modules that have an output power of 5mW or less do not require special heat sinking.
All other modules require heat sinking to remove waste heat from the module which will improve the stability characteristics and increase the lifetime. For better heat dissipation from the laser diode module use aluminum or copper holders to remove heat energy, do not place excessive force on the modules, this may cause internal damage.

4.3 Laser module operation requirements

Electrical signals should comply with the specification of the laser diode module.
It is strictly prohibited to expose the optical surfaces of the module to hard particles of any size, as it can damage optical coatings and integrity of optical parts.

FRANKFURT LASER COMPANY
An den 30 Morgen 13, 61381 Friedrichsdorf, Germany
Tel.: +49(0)6172.27978-0 Fax: +49(0)6172.27978-10
E-mail: sales@frlaserco.com; Internet: **WWW.FRLASERCO.COM**

5. ELECTRICAL CONNECTION

ATTENTION!
Laser diode module housing has electrical potential

5.1 Module with wires

5.1.1 Connect red wire to power supply: 5V*
5.1.2 Connect black wire to power supply: 0V
5.1.3 Turn “ON” the power supply
5.1.4 Turn “OFF” the power supply

*Please insure that the module is for 5V some versions may operate at different voltages, if you are unsure please contact Frankfurt Laser Company.

5.2 Module with connector

For convenience customer may also choose the connector option, in the interests of simplicity the pins will be referred to with equivalence to the module with wires and therefore

Pin 1 = Black Wire
Pin 2 = White Wire
Pin 3 = Blue Wire
Pin 4 = Brown Wire

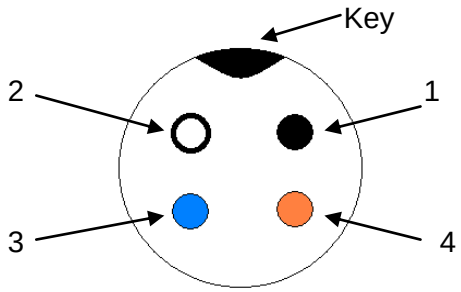


Diagram shows the connector mounted to the module

Cable is enclosed.

Please ensure that the correct signal is applied to the correct pin.
Any pins that are not in use should be isolated.

5.3 Module with PCS & BNC

For this module the connectors are factory fitted to the module, please ensure the correct voltage is applied to each terminal as illustrated in the appropriate datasheet accompanying the module.

FRANKFURT LASER COMPANY
An den 30 Morgen 13, 61381 Friedrichsdorf, Germany
Tel.: +49(0)6172.27978-0 Fax: +49(0)6172.27978-10
E-mail: sales@frlaserco.com; Internet: **WWW.FRLASERCO.COM**

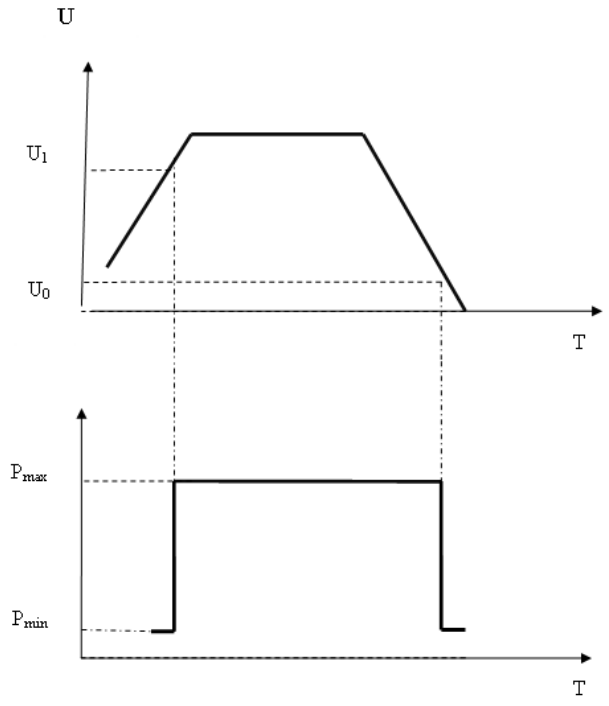
5.3 Working with the module for module with TTL input (Module with connector)

5.3.1 Connect red wire to power supply: 5V
5.3.2 Connect black wire to power supply: 0V and “GND” digital generator

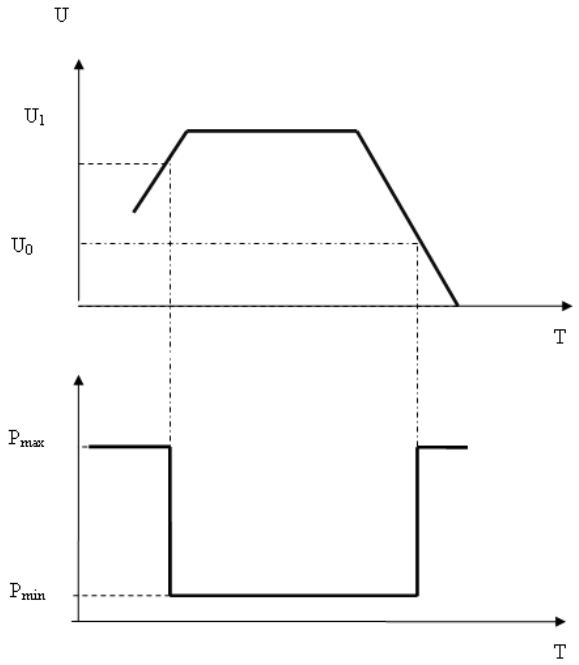
5.3.3 Positive TTL Modulation type
Connect blue wire to digital generator output.
Low level must be 0…0.5V, high level 3.5…5V.
If modulation is not required, to keep operating the laser diode module in CW mode, connect the blue wire with the red wire.

5.3.4 Negative TTL Modulation type
Connect blue wire to digital generator output.
Low level must be 3.5…5V, high level 0…0.5V
If modulation is not required, to keep operating the laser diode module in CW mode, connect the blue wire with the black wire.

5.3.5 Turn the power supply ON, then turn ON the digital generator, if required.
5.3.6 Work with the module.
5.3.7 Turn OFF the digital generator and then turn OFF the power supply



Positive TTL Modulation



Negative TTL Modulation

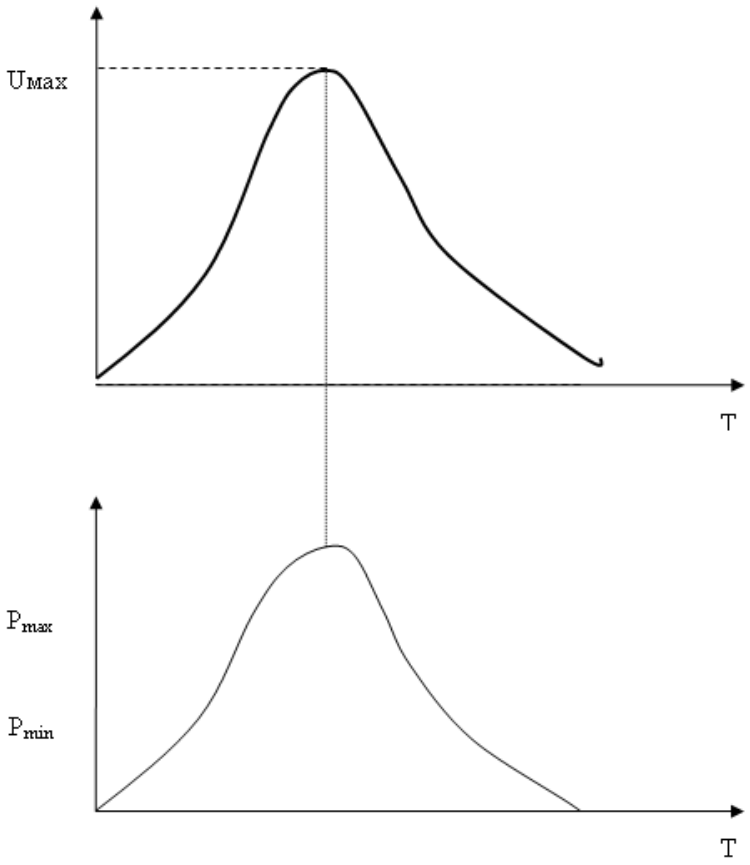
FRANKFURT LASER COMPANY
An den 30 Morgen 13, 61381 Friedrichsdorf, Germany
Tel.: +49(0)6172.27978-0 Fax: +49(0)6172.27978-10
E-mail: sales@frlaserco.com; Internet: **WWW.FRLASERCO.COM**

5.4 Working with the module for module with analogue modulation (Module with connector)

In this mode the output power of the laser diode module will depend on the input voltage from the secondary supply voltage unit

5.3.1 Connect red wire to power supply: 5V
5.3.2 Connect black wire to power supply: 0V and “GND” analogue generator

5.3.3 Connect brown wire to analogue generator output.
5.3.4 If modulation is not required, to keep operating the laser diode module in CW mode, connect the blue wire with the black wire.
5.3.5 Turn the power supply ON, then turn ON the analogue generator, if required.
5.3.6 Work with the module.
5.3.7 Turn OFF analogue generator and then turn OFF the power supply



Analogue Modulation

FRANKFURT LASER COMPANY
An den 30 Morgen 13, 61381 Friedrichsdorf, Germany
Tel.: +49(0)6172.27978-0 Fax: +49(0)6172.27978-10
E-mail: sales@frlaserco.com; Internet: **WWW.FRLASERCO.COM**

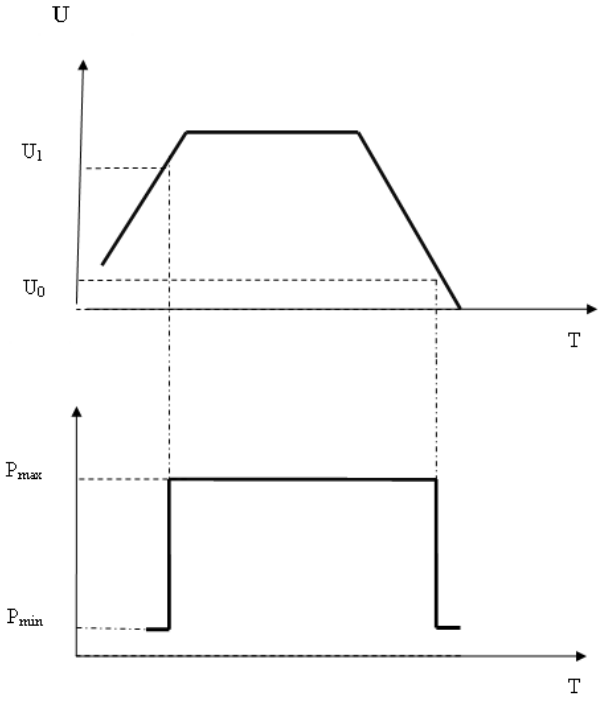
5.5 Working with the module for module with TTL input (Module with PCS & BNC)

5.5.1 Connect PCS to power supply: 5V
5.5.2 Connect BNC to digital generator ensuring correct polarity

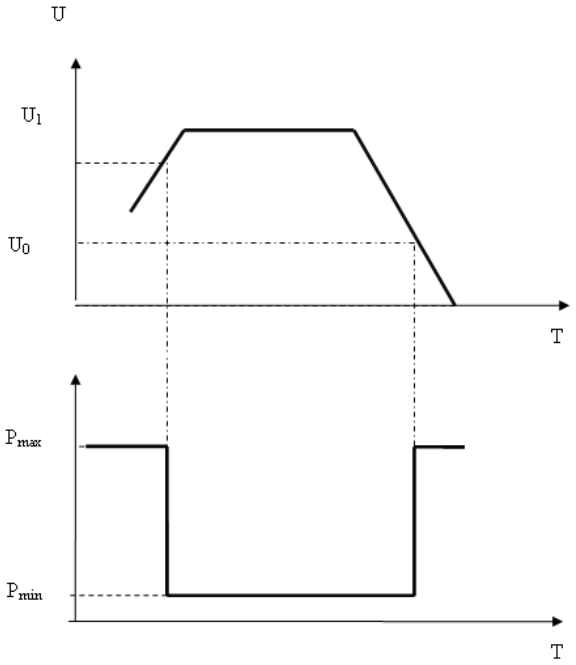
5.5.3 Positive TTL Modulation type
Low level must be 0…0.5V, high level 3.5…5V.

5.5.4 Negative TTL Modulation type
Low level must be 3.5…5V, high level 0…0.5V

5.5.5 Turn the power supply ON, then turn ON the digital generator, if required.
5.5.6 Work with the module.
5.5.7 Turn OFF the digital generator and then turn OFF the power supply



Positive TTL Modulation



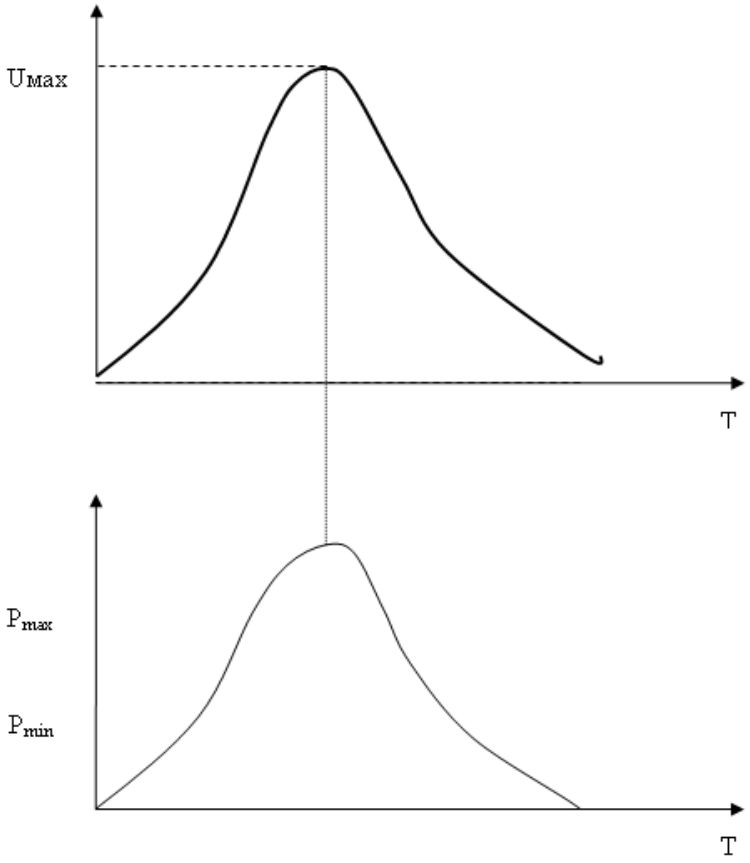
Negative TTL Modulation

FRANKFURT LASER COMPANY
An den 30 Morgen 13, 61381 Friedrichsdorf, Germany
Tel.: +49(0)6172.27978-0 Fax: +49(0)6172.27978-10
E-mail: sales@frlaserco.com; Internet: **WWW.FRLASERCO.COM**

5.6 Working with the module for module with analogue modulation (Module with PCS & BNC)

In this mode the output power of the laser diode module will depend on the input voltage from the secondary supply voltage unit

5.6.1 Connect PCS to power supply: 5V
5.6.2 Connect BNC to analogue generator
5.6.3 Turn the power supply ON, then turn ON the analogue generator, if required.
5.6.4 Work with the module.
5.6.5 Turn OFF analogue generator and then turn OFF the power supply

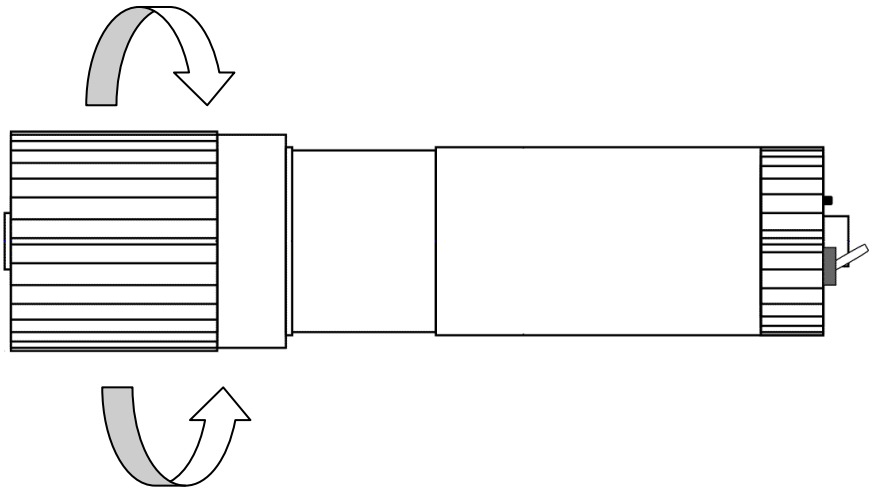


Analogue Modulation

FRANKFURT LASER COMPANY
An den 30 Morgen 13, 61381 Friedrichsdorf, Germany
Tel.: +49(0)6172.27978-0 Fax: +49(0)6172.27978-10
E-mail: sales@frlaserco.com; Internet: **WWW.FRLASERCO.COM**

6. ADJUSTING THE OPTICAL OUTPUT

The HMML module has been specifically designed to provide a non Gaussian line output. To adjust the line output (the line thickness) at a given distance the user must rotate the barrel of the laser diode module as shown below.



Rotate the module to adjust the line thickness

FRANKFURT LASER COMPANY
An den 30 Morgen 13, 61381 Friedrichsdorf, Germany
Tel.: +49(0)6172.27978-0 Fax: +49(0)6172.27978-10
E-mail: sales@frlaserco.com; Internet: **WWW.FRLASERCO.COM**

7. MAINTENANCE AND REPAIR

The laser diode module does not require any special maintenance. The optical window can be cleaned occasionally with a soft cloth or using air flow.

In case of failure, do not attempt to repair the product yourself! Please, return the product to the vendor immediately.

8. GUARANTEE

Guarantee period is 12 months from the day the module is delivered.

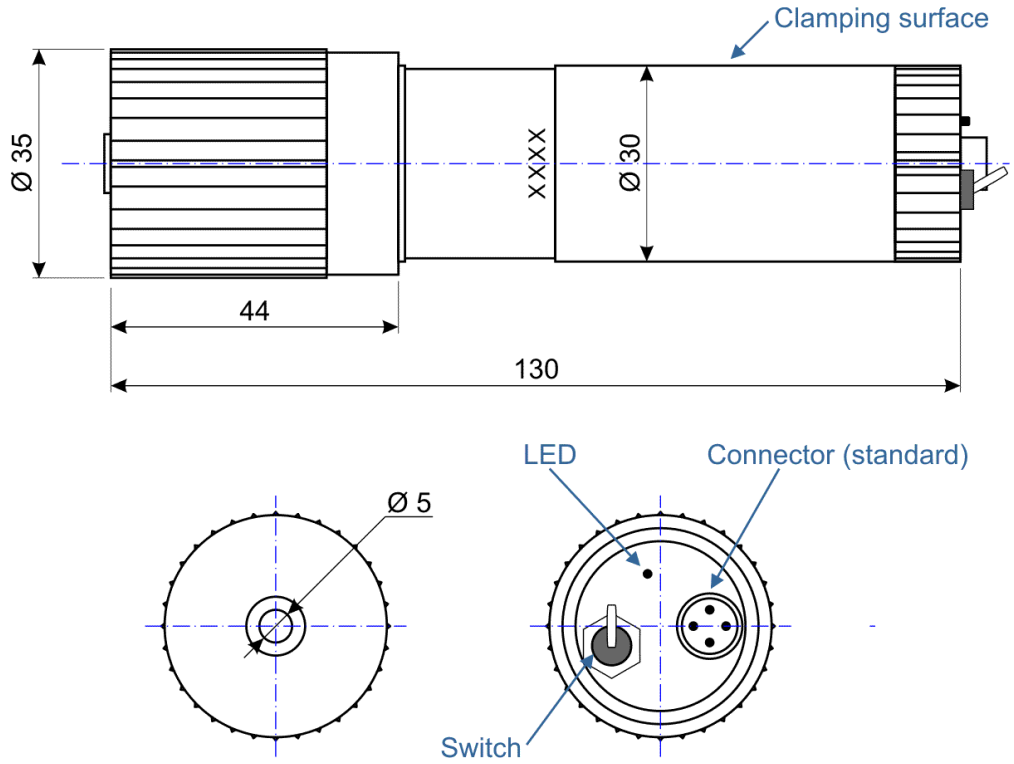
The guarantee is void, if the laser module:

- was used not in accordance with manufacturer's instruction manual
- dissembled, regulated without manufacturer's written consent
- was exposed to aggressive environment (liquids, rough dust)
- does not have the serial number

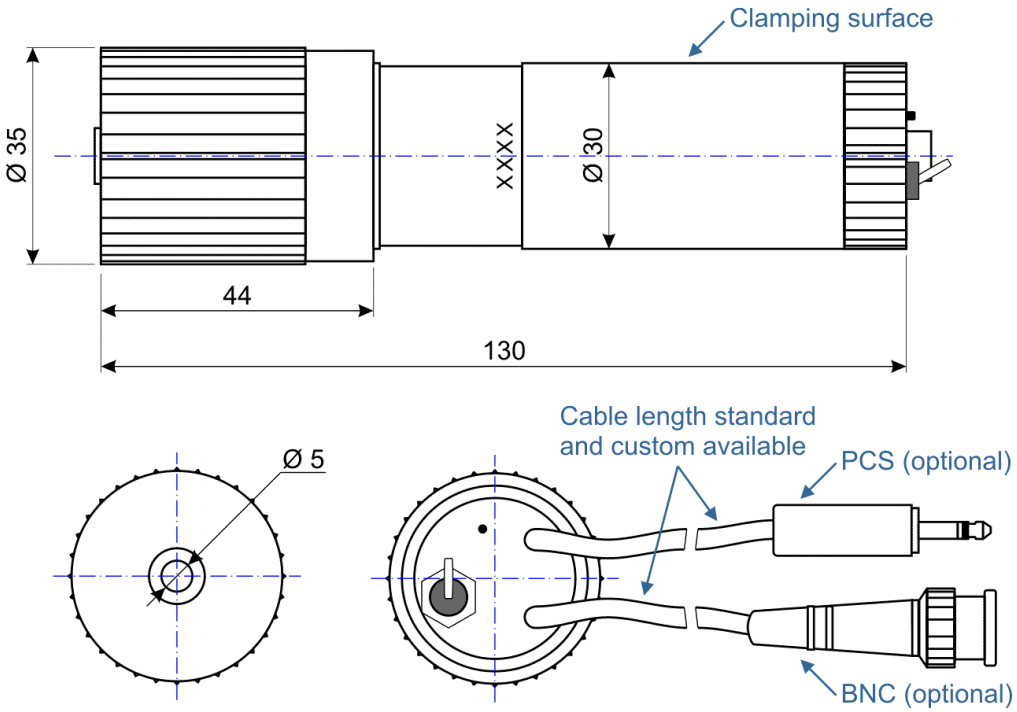
FRANKFURT LASER COMPANY
An den 30 Morgen 13, 61381 Friedrichsdorf, Germany
Tel.: +49(0)6172.27978-0 Fax: +49(0)6172.27978-10
E-mail: sales@frlaserco.com; Internet: **WWW.FRLASERCO.COM**

9. MODULE DRAWINGS

9.1 HMML with connector



9.2 HMML with PCS and BNC



FRANKFURT LASER COMPANY
An den 30 Morgen 13, 61381 Friedrichsdorf, Germany
Tel.: +49(0)6172.27978-0 Fax: +49(0)6172.27978-10
E-mail: sales@frlaserco.com; Internet: **WWW.FRLASERCO.COM**

10. ACCESSORIES

The following accessories are also available for the laser diode module

10.1 Wall Plug Power Supply

For those that wish to use a standard voltage socket to power the module we are able to offer the appropriate power supply, please contact Frankfurt Laser Company for further details

10.2 Laser Diode Module Mount

The following mount is available to hold the laser diode module is position, the mount also allows easy adjustment.

FRANKFURT LASER COMPANY
An den 30 Morgen 13, 61381 Friedrichsdorf, Germany
Tel.: +49(0)6172.27978-0 Fax: +49(0)6172.27978-10
E-mail: sales@frlaserco.com; Internet: **WWW.FRLASERCO.COM**